

Patent Claims

1. Pressure sensor for measuring a pressure of a medium,
5 comprising:

A pressure measuring cell having an end face loadable with the medium;

10 a housing having a media opening and a ring-shaped, axial bearing surface surrounding the media opening;

a clamping apparatus; and

15 a ring-shaped sealing arrangement; wherein

the pressure measuring cell is positioned in the housing and the sealing arrangement is positioned between the bearing surface and the end face, and the sealing arrangement, as well as the pressure measuring cell are axially clamped between the bearing surface and the clamping apparatus, characterized in that
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the sealing arrangement includes a decoupling ring as well as a first, and a second, ring-shaped sealing element, the first sealing element 25 lies against the end face, the second sealing element lies against the bearing surface, and the decoupling ring is axially clamped between the first sealing element and the second sealing element.

2. Pressure sensor as claimed in claim 1, wherein the pressure measuring cell has a platform, and a measuring membrane, of a first material and the decoupling ring is made of a second material, wherein the mechanical and/or thermal properties of the first material equal those of the second material.
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3. Pressure sensor as claimed in claim 2, wherein the first material and the second material are equal.
4. Pressure sensor as claimed in one of the claims 2 or 3, wherein
5 the first material comprises a ceramic, especially corundum, or a crystalline material.
5. Pressure sensor as claimed in one of the preceding claims,
10 wherein the first and/or the second sealing element comprise(s) an inert material, especially PTFE.
6. Pressure sensor as claimed in one of the preceding claims,
wherein the decoupling ring is bounded in the axial direction by two
15 planparallel end faces.
7. Pressure sensor as claimed in claim 6, wherein the end faces have ring-shaped projections and/or cavities.
8. Pressure sensor as claimed in one of the preceding claims,
wherein the clamping apparatus and/or the housing includes an axially
20 elastic element.
9. Pressure sensor as claimed in claim 8, wherein the axial clamping pressure on the first and second sealing elements fluctuates over temperature cycles between -40°C and 150°C by not more than
25 40%, preferably by not more than 20% and especially preferably by not more than 10% of the maximum occurring clamping pressure.
10. Pressure sensor as claimed in claim 8 or 9, wherein the axial clamping pressure on the first and second sealing elements does not, over temperature cycles between -40°C and 150°C, sink below 0.8
30 MPa, preferably not below 0.9 MPa and especially preferably not below 1 MPa.

11. Pressure sensor as claimed in one of the claims 8 to 10, wherein the elastic element comprises a Belleville spring having the axial bearing surface.
- 5 12. Pressure sensor as claimed in one of the claims 8 to 10, wherein the elastic element is embodied as an axially flexible, corrugated tube membrane surrounding the media opening, wherein the corrugated tube membrane has at a first axial end the axial bearing surface and wherein the corrugated tube membrane is connected 10 pressure-tightly with the housing at a process connection and at a second end.
- 15 13. Pressure sensor as claimed in one of the preceding claims, further comprising a compensation ring, which is axially clamped together with the pressure measuring cell, wherein the compensation ring has a greater coefficient of thermal expansion than the material of the housing, and the pressure measuring cell has a smaller coefficient of thermal expansion than the material of the housing.
- 20 14. Pressure sensor as claimed in claim 13, wherein the compensation ring comprises zinc, magnesium or aluminum.